

### REMARKS

Claims 1-9 are pending in this application. The specification has been amended to delete the paragraph on page 5, line 22 to page 6, line 4 – the subject matter contained therein is repeated in adjacent paragraphs of the specification.

Applicant's invention is directed to a semiconductor package with a **flash-proof device** 24 (see FIG. 2), in which a molding resin can be prevented from flashing on a back side of a substrate, thereby improving heat dissipating efficiency and assuring adequate electrical connectivity through electrical connection terminals 203.

As recited in claim 1, the flash-proof device is attached to the first side of the substrate and formed with a cavity for receiving a chip and a passive device therein, wherein a distance in elevation from a top side of the flash-proof device to the first side of the substrate is slightly greater than a depth of a molding cavity of a mold used in a molding process.

With reference to FIG. 3, a height **H** from the top side 242 of the flash-proof device 24 to the first side 200 of the substrate 20 is *slightly greater than* a depth **h** of the molding cavity 270a (see page 6, lines 12-14 of the specification). Because of this slight difference in height, the upper mold 270 pushes against the flash-proof device 24, and this force is then transmitted to the substrate, so the second side of the substrate 20 is hermetically sealed from the lower mold 271 (see page 6, lines 15-18). Therefore, a molding resin used to form the encapsulant 26 can be prevented from flashing on the second side 201 of the substrate 20. Moreover, the Applicant's invention can be used in conjunction with conventional molds, without requiring the use of a special mold for vacuum adsorption.

Claims 1, 4, 6, and 8 were rejected under 35 USC 103(a) as being unpatentable over "AAPA" in view of U.S. Patent 6,191,360 to Tao et al. (hereinafter "Tao"). Claims 2, 3, and 9 were rejected under 35 USC 103(a) as being unpatentable over "AAPA" in view of Tao, and further in view of U.S. Patent 6,392,900 to Petty et al. Claim 5 was rejected under 35 USC 103(a) as being unpatentable over "AAPA" in view of Tao, and further in view of U.S. Patent

6,069,027 to Mertol et al. Claim 7 was rejected under 35 USC 103(a) as being unpatentable over "AAPA" in view of Tao, and further in view of U.S. Patent 6,294,831 to Shishido et al. These rejections are respectfully traversed, and for convenience are addressed together.

As discussed in the Background section of the application, FIG. 9 illustrates a conventional resin encapsulated package with a substrate 10, a chip 11, and a passive device 12. The chip and the passive device are surface mounted on top of the substrate. However, in order to prevent resin flash in the semiconductor package of FIG. 9, a vacuum mold having a hole in the lower mold must be used to provide suction of the substrate against the lower mold. As noted in the Background section of the application, the vacuum mold increases the cost and complexity of manufacturing the package (see page 2, lines 5-9), and yet does not eliminate the problem of resin flash. As stated in the Office Action, the prior art (e.g., FIG. 9) discussed in the application "fails to disclose a flash proof device attached to the first side of the substrate" (Office Action, page 2).

The Tao reference fails to remedy the deficiencies of the above-referenced prior art. Specifically, Tao fails to teach or suggest a **flash-proof device** attached to the first side of the substrate, wherein a distance in elevation from a top side of the flash-proof device to the first side of the substrate is slightly greater than a depth of a molding cavity of a mold.

Tao is directed to a BGA package for providing heat dissipation by the use of a heat spreader 34 which conducts heat from the top surface of a chip 33 through a pad 32 (see FIG. 3). An encapsulant 38 is exposed on the top of the heat spreader for heat convection. In Tao, heat is dissipated through the top part 37 and bottom part 35 of the heat spreader 34 by further conducting the heat either to some heat dissipation elements or to the air. Tao does not teach or suggest that the heat spreader 34 is a "flash-proof device"; i.e., the heat spreader 34 does not address the problem of resin flash. Moreover, Tao teaches away from the Applicant's claimed invention by providing protrusions 36 on the bottom part 35 of the heat spreader 34, allowing encapsulating material to flow through a plurality of gaps 35a into the heat spreader 34 (see column 3, lines 46-54 and FIG. 3a of Tao). Such a design increases the effect of resin flash.

Tao also fails to teach or suggest a "flash-proof device" having a height which is slightly greater than a depth of a molding cavity of a mold. There is no teaching or suggestion of this claimed feature anywhere in Tao, and the heat spreader 34 is not provided to address the problem of resin flash.

On page 3 of the Office Action, it was stated that: "a distance in elevation from a top side of the heat spreader to the first side of the substrate is made to be slightly greater than a depth of a molding cavity of a mold" (Page 3, paragraph 1). However, the Examiner has not identified, and there does not exist, any passage in Tao to justify this assertion. Moreover, it would not be obvious to construct the heat spreader 34 in this manner, because the package in Tao does not address the problem of resin flash, but instead encourages the flow of resin through gaps 36a in the heat spreader.

Therefore, even if Tao were somehow combined with "AAPA," it would not be possible to produce the Applicant's claimed invention. The combination of "APAA" in view of Tao does not teach or suggest at least the above-referenced features of claim 1. Accordingly, claim 1 and dependent claims 2-9 should be in condition for allowance.

It is believed the application is in condition for immediate allowance, which action is earnestly solicited.

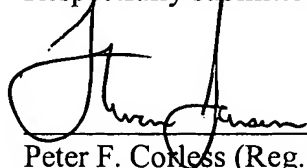
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